

REMARKS

Claim 7 has been canceled. Claims 1, 8, and 15 have been amended. Claims 1 through 6 and 8 through 20 remain in the application.

The specification has been amended on page 1 to add the provisional application number as requested by the Examiner.

Claims 8 through 13 and 15 through 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by RAMSIS (Human Solutions). Applicants respectfully traverse this rejection.

RAMSIS (Human Solutions) discloses a 3D-CAD-ergonomics tool, which was designed in cooperation with the German automobile industry for the development of vehicles and cockpits. RAMSIS VR enables the realistic blending of artificial visual perception and natural haptic feedback in the virtual world. The RAMSIS VR concept encompasses the complete process chain from virtualization of a real person, motion capturing in the physical world, and real-time tracking of the digital twin. The actor's movements are captured in real-time by up-to-date motion tracking systems and directly transferred to RAMSIS VR. The highly performant RAMSIS VR makes the digital twin act synchronously to the real person, mirroring his or her motion in detail. While the test person is immersed into the artificial world, the geometry of the facsimile acting absolutely synchronously is feed back to his/her eyes via the VR system. The impression of seeing the own body in the virtual environment raises the actor's perception to a superior level of immersion. RAMSIS does not disclose determining a scale ratio and range of a target population for an evaluator, wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of the target population.

In contradistinction, claim 8, as amended, clarifies the invention claimed as a method of subjective evaluation of a vehicle design within a virtual environment using virtual

reality. The method includes the steps of preparing an evaluator of a vehicle design for immersion as a virtual human in the virtual environment, wherein the virtual environment is created within a computer system and includes the vehicle design. The method also includes the steps of determining a scale ratio and range of a target population for the evaluator, wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of the target population. The method includes the steps of preparing an adjustable property using the vehicle design and the scale ratio and growing the virtual human within the virtual environment to virtually represent a scaled evaluator. The method further includes the steps of aligning the virtual human in the virtual environment with the evaluator and the property, performing the evaluation of the vehicle design by the evaluator, and using the evaluation of the vehicle design in the design of the vehicle. Claim 15 has been amended similar to claim 8 and includes other features of the present invention.

A rejection grounded on anticipation under 35 U.S.C. § 102 is proper only where the subject matter claimed is identically disclosed or described in a reference. In other words, anticipation requires the presence of a single prior art reference which discloses each and every element of the claimed invention arranged as in the claim. In re Arkley, 455 F.2d 586, 172 U.S.P.Q. 524 (C.C.P.A. 1972); Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983); Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 U.S.P.Q. 481 (Fed. Cir. 1984).

The Examiner performed a trademark search on the mark “RAMSIS”, which had a filing date of July 31, 1997 and is owned by Bruker-Saxonia Analytik GMBH. On the other hand, RAMSIS is owned by Human Solutions GmbH. Clearly, these are two different entities. However, Purschke et al. discloses RAMSIS and has a publication date of June 1998. Applicants respectfully request the Examiner to correct the record to reflect a June 1998 date for RAMSIS.

RAMSIS does not disclose or anticipate the claimed invention of claims 8 through 13 and 15 through 18. Specifically, RAMSIS merely discloses a 3D-CAD-ergonomics tool for the development of vehicles and cockpits in which an actor's movements are captured in real-time by up-to-date motion tracking systems and directly transferred to RAMSIS VR, which makes the digital twin act synchronously to the real person. RAMSIS lacks determining a scale ratio and range of a target population for an evaluator, wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of the target population. In RAMSIS, the achievability analysis discusses the calculation of achievability fields dependent on type, but does not mention determining either a scale ratio or a range of a target population for an evaluator.

RAMSIS fails to disclose the combination of a method for subjective evaluation of a vehicle design within a virtual environment using virtual reality including the steps of preparing an evaluator of a vehicle design for immersion as a virtual human in the virtual environment, determining a scale ratio and range of a target population for the evaluator, wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of the target population, preparing an adjustable property using the vehicle design and the scale ratio, growing the virtual human within the virtual environment to virtually represent a scaled evaluator, aligning the virtual human in the virtual environment with the evaluator and the property, performing the evaluation of the vehicle design by the evaluator, and using the evaluation of the vehicle design in the design of the vehicle as claimed by Applicants. Therefore, it is respectfully submitted that claims 8 and 15 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 102(b).

Claims 1 through 7, 14, 19, and 20 were rejected under 35 U.S.C. § 103 as being unpatentable over RAMSIS in view of Purschke et al. (Virtual Reality-New Methods for

Improving and Accelerating the Development Process in Vehicle Styling and Design (1998)).

Applicants respectfully traverse this rejection.

The publication “Virtual Reality-New Methods for Improving and Accelerating the Development Process in Vehicle Styling and Design” to Purschke et al. discloses the use of virtual reality techniques during the car development process. As input devices, a CyberGlove is used for navigating in the virtual environment and for gesture recognition. Purschke et al. does not disclose a scaleable physical property representative of a vehicle design, wherein the physical property is adjusted according to a scale ratio for an evaluator of the vehicle design and the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population.

In contradistinction, claim 1, as amended, clarifies the invention claimed as a system for subjective evaluation of a vehicle design within a virtual environment using virtual reality including a scaleable physical property representative of the vehicle design. The physical property is adjusted according to a scale ratio for an evaluator of the vehicle design. The scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population. The system also includes a computer system for digitally creating a virtual environment having a virtual human immersed within the virtual environment, wherein the virtual environment includes the vehicle design and the virtual human virtually represents a scaled evaluator. The system includes a motion capture system for sensing a motion of the evaluator and communicating the sensed motion of the evaluator to the computer system, so that the motion of the evaluator controls the motion of the virtual human in the virtual environment. The system further includes a virtual reality display mechanism operatively communicating with the computer system, for providing the evaluator a view of the virtual environment while evaluating the vehicle design.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that “[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) (“In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.”)

None of the references cited, either alone or in combination with each other, teach or suggest the claimed invention of claims 1 through 6, 14, 19, and 20. Specifically, RAMSIS merely discloses a 3D-CAD-ergonomics tool for the development of vehicles and cockpits in which an actor’s movements are captured in real-time by up-to-date motion tracking systems and directly transferred to RAMSIS VR, which makes the digital twin act synchronously to the real person. RAMSIS lacks a scaleable physical property representative of a vehicle design, wherein the physical property is adjusted according to a scale ratio for an evaluator of the vehicle design and the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population. In RAMSIS, the achievability

analysis discusses the calculation of achievability fields dependent on type, but does not mention a physical property adjusted according to a scale ratio for an evaluator or a scale ratio is a ratio between a predetermined dimension of an evaluator and a predetermined dimension of a member of a target population.

Purschke et al. merely discloses the use of virtual reality techniques during the car development process in which a CyberGlove is used for navigating in the virtual environment and for gesture recognition. Purschke et al. lacks a scaleable physical property representative of the vehicle design, wherein the physical property is adjusted according to a scale ratio for an evaluator of the vehicle design and the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population. In Purschke et al., there is no mention of a physical property being adjusted according to a scale ratio for an evaluator or a scale ratio is a ratio between a predetermined dimension of an evaluator and a predetermined dimension of a member of a target population. As such, there is no suggestion or motivation in the art to combine RAMSIS and Purschke et al. together.

The present invention sets forth a unique and non-obvious combination of a system for subjective evaluation of a vehicle design within a virtual environment using virtual reality that scales the size of the evaluator in the virtual vehicle environment, so the evaluator can understand how another member of the target population perceives the vehicle design. The references, if combinable, fail to teach or suggest the combination of a system for subjective evaluation of a vehicle design within a virtual environment using virtual reality including a scaleable physical property representative of the vehicle design, wherein the physical property is adjusted according to a scale ratio for an evaluator of the vehicle design and the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population, a computer system for digitally creating a virtual environment